CLOSURE PLAN CONTENTS AND TECHNICAL REVIEW

3.6 - DECONTAMINATION PROCEDURES FOR EQUIPMENT, STRUCTURES, AND BUILDINGS

The closure plan must identify all areas requiring decontamination. Detailed procedures for cleaning, removing, or disposing of contaminated equipment, structures, and buildings must be provided in the closure plan.

1. Contaminated Equipment, Structures, and Buildings

The owner or operator should provide a list of all equipment, structures, and buildings that will require decontamination or off-site disposal during final closure. Examples include:

- Tanks and containers;
- Treatment process components (e.g., scrubbers, filter presses, heat exchangers);
- Equipment used prior to storage or treatment in tanks (e.g., waste feed systems, bypass systems, conveyors);
- Piping, pumps, and valves;
- Secondary containment systems (e.g., concrete pads, dikes, berms);
- Drainage pits and sumps;
- Portable spill containment systems;
- Floors and walls of buildings used to house hazardous waste management units;
- Truck staging areas;
- Equipment used in waste handling and emergency response (e.g., forklifts, drum dollies, pallets, drip pans, hand pumps, spill absorbent, booms, shovels);
- Earth-moving equipment used in facility decontamination (e.g., trucks, front-end loaders, bulldozers);
- Equipment used in facility decontamination during final closure (e.g., booms, pumps, temporary containment systems);
- Personal protective garments and equipment.

2. Decontamination Procedures

The owner or operator may decontaminate equipment and structures to achieve the closure performance standard. The closure plan should provide detail procedures for decontaminating equipment and structures. These procedures should include the following:

- Waste removal from tanks, containers, treatment process equipment, sumps, and any other equipment used to treat hazardous wastes;
- Selection of decontamination methods for equipment and structures with justification for their suitability;

! Description of the decontamination equipment's capability and operating requirements (this information provides bases for cost estimate); and

! Containment, temporary storage, and subsequent disposal of decontamination residues as hazardous wastes.

The decontamination methods will vary depending on what is being cleaned and on the type of contaminant. There is no regulatory requirement specifying decontamination methods for different types of equipment or structures. However, the owner or operator should use the best available decontamination methods to achieve closure performance standard. Information about decontamination methods and procedures can be found in the Guide for Decontaminating Building, Structures, and Equipment at Superfund Sites, U.S. EPA, Office of Research and Development, March 1985, and Chapter 10 of the Occupational Safety and Health Guidance Manual for Hazardous Waste Sites (NIOSH, 1985). For a treatment and storage facility, the following decontamination methods are commonly used:

a. Hydroblasting - Hydroblasting removes surface contaminants by using a high-pressure water jet. This method can remove a thin layer of material on concrete, brick, or metal surface. Hydroblasting may incorporate variations such as hot or cold water, abrasives, solvents, surfactants, and varied pressures. This method is not applicable for removing a contaminant that has penetrated into the equipment or structure surface.

b. Steam Cleaning - Steam cleaning physically extracts a contaminant from equipment or structure surface. It is often used to remove contaminated soil from earth moving and drilling equipment. Steam cleaning produces less wastewater than hydroblasting. Removal or reaction of contaminants from the subsurface is probably poor as many contaminants have low solubilities in water.

c. Solvent Washing - Solvent washing dissolves and removes contaminants that are not water soluble. The success of this method depends on the miscibility between solvents and contaminants. The primary difficulty is that penetration of the solvent into porous material, followed by outward diffusion, may require a long period of time.

d. Sandblasting - Sandblasting is an abrasive decontamination method that strips off the top layer of equipment or structure surface. It is an effective method to remove gross contaminants before subsequent application of other decontamination methods. Sandblasting is advantageous over hydroblasting or solvent washing since its effectiveness does not depend on solubility of a contaminant in a cleaning agent. Precaution should be taken to confine airborne particulates generated.

e. Pressure Flushing - Pressure flushing utilizes pressurized water to clean the interior surfaces that are inaccessible by hydroblasting. Pressure flushing dislodges contaminants adhering to the interior surfaces of pipings, pumps, and other internal parts of the process equipment. Surfactants, caustic solutions, or commercial cleaners can be added to the water to decrease surface tension and increase effectiveness.

f. Dismantling/Demolishing - Dismantling and demolishing allow the owner or operator to disassemble the equipment into components or manageable pieces. This method separates types of equipment that are not feasible to be decontaminated and have to be disposed of as hazardous waste from that equipment which can be disposed of as non-hazardous waste.

All cleaning residues (e.g., rinsewater, sandblasting grit) are hazardous wastes and must be managed accordingly, unless the owner or operator can show that these residues are non-hazardous pursuant to 22 CCR 66261.3(d).

KEY QUESTIONS:

! Are there any omissions to the list of possibly contaminated equipment and structures?

- How will the owner or operator manage residues generated from the decontamination procedures?
- Was there a description of how rinsewater or condensates will be collected?
- If sandblasting is proposed, how will airborne contamination be controlled?

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List of Examples:

List of Attachments:

List of References:

List of Appendices: